green-house purposes is sold at the rate of ten shillings per hundred superficial feet, weighing fourteen ounces to the foot. We are much mistaken if the two railway magnates who have just established a glass-work in Sunderland will not produce it cheaper than this.

Around the outer wall we would erect dwellings of two floors, leaving four gateways into the inner square. The exuviæ from these dwellings would be carried by pipes to a common receptacle to be applied to the purposes of manure, so chemically prepared on the plans of Liebig as to neutralize all odour. The number of dwellings surrounding an inclosure of four acres would be about eighty. Assuming four grown persons for each, the exuviæ would be equivalent to manure the heavy corn crops of one hundred and sixty acres of ground, and be worth 300*l.* per annum or more.

The internal building or green-house would thus be very cheaply attained. The external walls would be gratuitous, as being part of the houses, and the central columns would serve as rain conduits; the ground would require no paving or laying, and the only real cost would be the roof.

The application of this large green-house would be for the production of vegetables in the winter time. Four acres thus inclosed and sheltered would be multiplied in value many fold. Produced on the very verge of the railway, the crops could be gathered and delivered direct into the markets of the city within an hour of cutting. At other periods the external land could be applied to the same purposes.

For all these arrangements the steam-engine would be a most valuable adjunct. The waste steam would warm the green-house and the dwellings, and would serve the purposes of cookery, either in a general kitchen or separately. The condensation water would supply baths, and thus be rendered available for irrigation purposes. It would serve also for washing clothes, and the steam would serve for drying them."

This is with a view to towns-people with small incomes; for the rich he goes further:—

"On a healthy spot, say Epsom Downs, we would erect a similar glazed inclosure as a winter garden and walk for the inhabitants of surrounding villas. If the neighbourhood increased, a school and a lecture-room, a library, and perhaps a theatre, should be added to the establishment; but in all cases a steam-engine or steam-engines should be the sources for warming, ventilation, and baths. We can imagine that all the luxuries procurable at the country houses of the wealthiest landholders might thus be achieved at a moderate cost. With large neighbourhoods even Chatsworth might be eclipsed. With double glass roofs a very small quantity of fuel would suffice to warm a conservatory of very large size.

It must be obvious that on such a plan the whole road would rapidly become a system of detached buildings; for the facility of obtaining water and fuel at every point would remove all obstacles. It would be worth the while of the inhabitants to pay an annual rate to the road makers, and throw it open to all dwellers on the line.

If our views be correct, the time will come when railways will be made for the purpose of bringing land into cultivation, when every two miles of land will be intersected with a railway throughout the whole country. If this be so, where is the wisdom of the men who are expending money in millions merely to oppose fancied rivals? Where is the use of crushing an opponent at ten miles' distance, when two or three other lines are sure to intervene subsequently? If we cast our eyes over the map, we cannot resist the conviction that every mile of highway will ultimately be replaced by two miles of railway. We cannot but laugh at the opposition to the London and York by the London and Birmingham, while perhaps at the very time a new line is in contemplation between both. As the conviction grows that the railway is not the mine—that the land is the true mine—and the railway is but the access to the mine, this sort of absurd opposition will diminish and disappear."

The article ends with a proposition which will be ridiculed by many and deemed chimerical by most, but nevertheless is worthy of consideration.

"Unless a succession of bad harvests intervene to check prosperity, the year 1850 will behold the extinction of horses as a moving power in England, for the purposes of pecuniary gain in the public transport of passengers and goods. Every new street, every village, every farm will have its railway, and stationary power will have become so common in its numerous applications, that it will be turned on and off for the purposes of haulage as easily as gas jets for the purpose of lighting. And the modes of its application will be manifold. Beyond the mere purposes of traction, there are other important problems to work out. There is an important process to be achieved in English agriculture, which seems not yet to have entered into the imagination of any of our improvers. The reason seems to be that our chemists are not mechanicians, nor are our mechanicians chemists; but be it as it may, we have never yet seen the matter proposed, and possibly may run the risk of being deemed mere visionary enthusiasts for propounding it. Yet in sober earnestness we propose—

To convey artificial heat beneath the earth, on open land, so as to maintain the temperature suited to the growth and development of the vegetable tribes, by means of pipes of metal or earthenware; circulating steam, or hot water, or air, from a close boiler or stove. These pipes to be laid at depths of from 4 to 5 feet, in the manner of deep draining. Also, by a similar process, to inject the ground with gaseous manure, as ammonia and carbon, so that the heat and gases may be constantly ascending towards the surface, and thus be absorbed by the roots of the plants."

We may look for great things in the next twenty years.

JOTTINGS ABOUT RAILWAYS.

Any iron wheel may be made to travel almost noiselessly along a railway, it is said, by inclosing its two sides with boarding or thin metallic sheeting, so as to confine a quantity of sawdust in immediate contact with its spokes; sawdust being anti-vibratory will effectually prevent the wheel vibrating, thus enabling it to roll without noise. All who are interested in lessening the noise of railway wheels, should make this easy method as public as possible, so that railway directors may be urged to adopt a plan so inexpensive, efficacious, and desirable.——An ingenious plan for rendering the electric telegraph valuable as a means for indicating the precise position of a railway train upon different parts of the line, was lately submitted to the Academy of Sciences in Paris, by M. Dujardin, the inventor. He proposes, that as a locomotive passes by certain places, it shall touch a spring in connection with the wire, and then communicate with the index of the station by certain signs previously agreed on.——A project has just been made public having for its object the effecting a telegraphic communication, by means of electricity, between London and all the principal towns in England, and also between the principal large commercial towns. To carry out the project, it is proposed to establish a company, and to raise a capital of 500,000*l.*——In a recent number we gave an account of a method of obtaining vacuum for atmospheric railways by the direct action of steam, and gave credit to Mr. Nasmyth for the invention. It appears, however, that he was anticipated by Mr. Robert Mallet, Mem. Inst. C. E., who minutely described the process in a recent number of "Weale's Quarterly Papers on Engineering," and who claims the credit of being "the first inventor."——A series of private experiments has lately been made on the London and Croydon Railway, for the purpose of testing the powers of atmospheric propulsion. The question as to the power of ascending inclines has been completely set at rest. A train was brought to the foot of an incline of one in fifty, and stopped so as to deprive it of any power it might have acquired from the impetus of its previous progression. It was then propelled by the atmosphere up the incline, and that which many of our most eminent engineers have declared impossible was accomplished with the greatest ease imaginable. Among other results that have been obtained, we may mention that five miles length of tube has been exhausted in its whole extent, and that the piston has traversed the entire length of the tube.—— The death of Lord Canterbury, by apoplexy, in a railway carriage, has given occasion to a surmise that railway travelling conduces to that disease. Dr. Badeley, of Brighton, having fully investigated the subject, asserts that the surmise is wholly groundless. He says:—"If a calculation were made of the number of persons who have travelled by railway during the year, and the number of deaths from apoplexy that have occurred during the journey, I think that the question of cause and effect would at once be settled. Let the guards and the engineers be included in the calculation—men who are every day and all day engaged in their locomotive duty; has any single instance of apoplexy occurred in the whole corps? I have inquired of them whether their occupation has ever induced any affection simulating or threatening the disease in question, but I have, without exception been answered in the negative."——A novelty, in the form of a railway without steam or fire, presents itself in the proposed line from Callao to Lima, in Peru. The ground has a gradual and unbroken rise the whole way. Above Lima flows the river Rimac, which passes through a part of the city in its way to the sea near Callao. This river, though not navigable, affords at all seasons of the year a hundred times the water power necessary to work any traffic that can possibly come upon the rail. The saving of the usual expense of fuel is thus effected; and the cost of the steam-engines, and, what is no small item in railway expenditure, the charges for their after management are entirely avoided. —— The Duke of Cleveland has issued the strictest orders to all his tenants and servants, on no account to allow any railway engineer to make a survey through any part of his property, by giving all who attempt to do so notice to desist; and if this is disregarded, commencing immediately an action for trespass against them. Two parties of surveyors in the neighbourhood of Barnard Castle have lately been repulsed. Watchers are posted night and day on the look out. Sapient duke!

STEREOCHROMY.

A NEW METHOD OF ARCHITECTURAL PAINTING, BY DR. FUCHS AND PROFESSOR SCHLOTTHAUER IN MUNICH.

Experiments which have been carried on in this respect for the last two years, in the Bavarian capital, have reached that point, where it may safely be said, "The thing is done." The first subject, however, to be broached is, that the new method of painting bears no analogy to the Pompeian, either in principle, far less in its technical part; and that it is something quite original and new. On account of its thorough novelty and originality, it would be wrong to consider it merely as a *substitute*, and we are sure that the more known, the more it will be applied to those purposes for which painting *al fresco* has been hitherto used. The distinctive characteristics of this new method, from all other sorts of painting hitherto practised, are its great durability and indestructibility—resulting from the particular chemical composition and preparation of colours, and the method of using them. Under these circumstances, it is very probable, that it will outdo all other methods of architectural painting, and become a common property of civilized nations.

This new technicism has appeared under a new name—as Dr. Fuchs (*Ober-Bergrath* to the king of Bavaria) has thought, that the appellation of *stereochromy* would be the best adapted to its peculiar features. Still, it is a truly national, *German* discovery, resulting from that all-sided development of art, which has been concomitant in Bavaria with an improvement in all branches of artistic mechanism, nay even the handicraft operations of the artisan. What has been done in that country for the casting of metals, fresco painting, and encaustic, nay even for the mechanism of the different sorts of lithography and galvanoplastic, is the best proof of an activity, which, in the present instance, has yielded a great result.

The want of pliable and constant means of

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